from the subjects' medical files. Quality control on such measures as diagnosis could not be assessed. In addition, severity of the back pain could not be addressed except that, in general, those subjects with specific diagnoses had more severe back pain than subjects with nonspecific diagnoses, as evidenced by the longer absence from work for those subjects with specific diagnoses. For the multivariate analysis, we did adjust for diagnosis, using it as a proxy measure for severity. Data regarding physical therapy plans were taken from the forms submitted by the treating physical therapists to the QWCB. These were the initial forms, which included the proposed treatment plan only. Thus, it is not confirmed that all the treatment modalities proposed were actually used.

Conclusion
With escalating health care costs, particularly those related to workers' compensation, it is essential that management of patients be more efficient yet remain effective. Physical therapy is an important component in the treatment of back pain syndromes. More judicious use of physical therapy, both in terms of patient profile and in terms of timing of referral, is the goal in order to achieve the most favorable results and reduce morbidity. This study clearly indicates that physicians request physical therapy services based on certain patient characteristics. Whether the patients with those characteristics are those who benefit the most from physical therapy remains to be proven. Timing of referral for physical therapy is another factor to consider. The results show that those subjects who were referred within the first month following injury tended to return to work within a relatively short period of time. If an optimal time for physical therapy intervention could be determined, both costs and morbidity may be decreased.

Invited Commentary
Referral to physical therapy services has implications for both quality of patient care and costs to the health care system. Thus, it would be valuable to understand the factors that drive referral decisions. In the absence of adequate clinical studies on the efficacy of physical therapy approaches, however, it will not be possible to develop optimal referral guidelines or to know whether the rates of observed referrals are greater or lesser than they should be. Rational, well-based referral decisions and policies that take into account benefit and cost issues will require well-designed and well-executed randomized clinical trials.

Considering that little evidence is currently available about the efficacy of physical therapy interventions, or other interventions for that matter, it is no surprise that the reasoning behind referrals is unclear. The current state of knowledge about conditions underlying back problems, effective treatment, and prevention of common recurrences leaves most practitioners to rely on their beliefs and associated preferences. Referral patterns are likely to vary, not only by physician but also by geographical region and health care system. Thus, referral patterns identified in one country or health care system may not generalize to those present elsewhere.

One would expect to find factors associated with referral patterns, unless one believes that all patients have the same underlying pathology, symptom severity, and mitigating circumstances affecting the course of recovery, or that physical therapy is equally effective regardless of the condition, or

References
that referral is made purely at random. Ehrmann-Feldman et al found that workers with back "injuries" labeled something other than simply low back pain, strain, sprain, or lumbago were more likely to be referred for physical therapy. Women and older workers also were more likely to be referred. It is important to realize, however, that the factors associated with a higher frequency or incidence of back injury referrals may not directly affect the decision to refer. They may simply be covariates of other factors influencing referral. For example, differences in referral rates for women and men could be due to a multitude of different factors that have quite different implications, such as sociocultural factors, variations in pain behaviors, or differences in underlying pathology. The results of this study reveal factors associated with referral, but these results do not clarify how or whether the factors have a direct influence on the decision to refer.

Whether early referral for physical therapy is beneficial in achieving better patient outcomes is an important question. The question, however, cannot be answered with the research design used in this study. Ehrmann-Feldman and colleagues did a commendable job of designing inclusion criteria to minimize the effects of potentially confounding factors, using the data that were available to them. Yet, it is still likely that patients who were referred early versus late are different in other meaningful ways that could not be controlled in the investigators' analyses and that are likely to have affected outcome (return to work within 60 days postinjury). Ehrmann-Feldman and colleagues have brought the hypothesis that earlier referral for physical therapy achieves better outcomes to our attention again. It is now time to conduct a randomized clinical trial to test that hypothesis.

Author Response

The intent of our study was to describe the referral of compensated workers for physical therapy and to compare those workers who were referred and those workers who were not referred in terms of key characteristics. It was not the purpose of this investigation to determine the efficacy of physical therapy approaches (which would be impossible with such a design), nor did we propose to develop guidelines for appropriate referral. We agree with Dr Battie that those objectives would be best served by a randomized clinical trial design.

From our study, we did make certain observations regarding characteristics of workers who were most likely to be referred for physical therapy. Dr Battie states that these characteristics may simply be "covariates of other factors." Although other factors were certainly involved that were not measured in our study, we believe that our results are nevertheless valid for a number of reasons. The sample was a representative random sample of all workers compensated for low back pain. Although referral patterns differ by geographical region, we believe that individuals receiving workers' compensation (as opposed to the general population) in various countries may be comparable. Finally, our results concurred with those of other published studies that have shown that women and older subjects were more likely to be referred.

Our study used an analytic cohort design. It is true that our study design does not prove that early physical therapy is beneficial for earlier return to work. The fact remains, however, that those subjects who received physical therapy within the first 30 days after sustaining a back injury returned to work sooner than those who did not receive early physical therapy. We controlled for age, gender, and diagnostic category in the analysis because these variables were significant in the univariate analysis. In addition, diagnostic category served as a marker for severity because those subjects with a specific diagnosis were generally those with more severe injuries.

We agree with Dr Battie that the hypothesis that early physical therapy achieves earlier return to work would be best tested under the conditions of a randomized clinical trial. Among the difficulties in designing such a study would be the definition of the term "physical therapy" itself. Would specific treatment modalities or approaches be included as opposed to others? If the term is defined too specifically, would this study be generalizable to the majority of physical therapy situations, whereas if the term is too general, would any focused interest in the patient's problem be the answer?

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